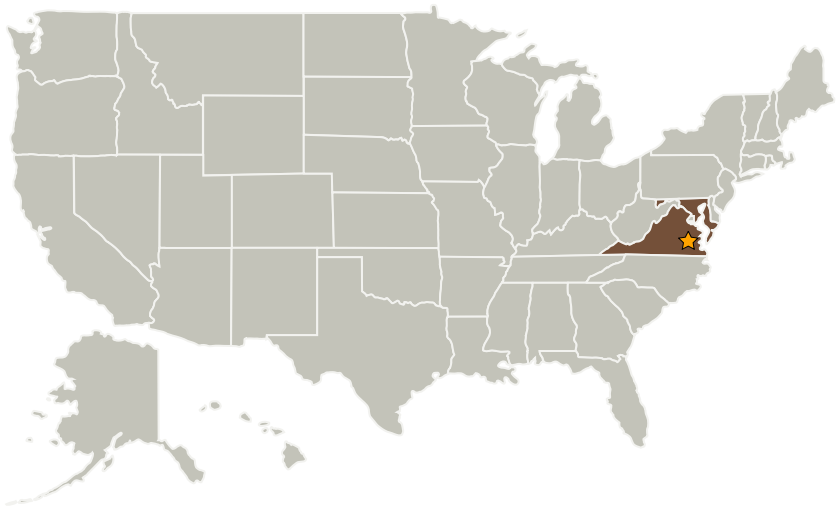
H/OZ: PFD and Collaborative Flight Control System, Phase II

Completed Technology Project (2009 - 2011)

Project Introduction

Researchers at the Institute for Human and Machine Cognition invented OZ, a primary flight display that provides a single, unified graphic display of critical flight information. OZ virtually eliminate the need to scan flight instruments and provides superior performance for flight in low visibility conditions compared to current integrated avionics displays. eSky licensed OZ and is commercializing it for general aviation applications. eSky previously demonstrated the superiority of OZ over current integrated avionics PFDs in high workload situations. NASA Langley and the German Aerospace Laboratory invented researchers H-mode, a collaborative flight control system that shares flight control between pilot and automation allowing the pilot to remain in-the-loop with a high level of situational awareness while retaining aeronautical decision making authority. In phase 1 eSky designed an integrated system (H/OZ) that uses OZ as the primary flight display in the H-mode flight control system (HFCS). H/OZ allows the pilot to maintain superior situational awareness while remaining engaged in the managing and directing the flight. eSky incorporated into both HFCS and OZ graphical elements new to both that support improved functionality. H/OZ has the following primary advantages over current integrated avionics systems: superior situational awareness; critical navigational information displayed on the PFD; real-time seamless allocation of control between pilot and automation; Point to Program (P2P) mechanism for visually selecting airspace elements for guidance; Focus to Display (F2D) mechanism for displaying on PFD and MFD screens only situationally relevant airspace information. eSky will integrate HFCS and OZ into a prototype H/OZ simulator with new functionality and conduct extensive usability and performance tests of the H/OZ system using human volunteers.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
Emerald Sky Technologies, LLC	Supporting Organization	Industry	Columbia, Maryland

Primary U.S. Work Locations	
Maryland	Virginia

Project Transitions

September 2009: Project Start

September 2011: Closed out

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.2 Extravehicular Activity Systems
    - TX06.2.3 Informatics and Decision Support Systems